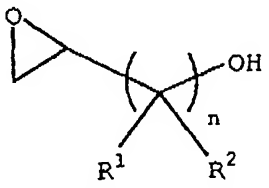
CLAIMS

1. A catalyst which contains at least one element selected from the group consisting of Group V elements, Group VI elements, Group VII elements, Group VIII elements, Group IX elements, Group X elements, and Group XI elements in the periodic table, and is to be used for subjecting an epoxy alcohol represented by the following general formula (1) to a hydrogenolysis reaction in the presence of at least one solvent selected from the group consisting of ethers, esters, aromatic hydrocarbon compounds, alicyclic hydrocarbon compounds and aliphatic hydrocarbon compounds, to thereby obtain a both end-hydroxyl group-terminated diol represented by the following general formula (2).

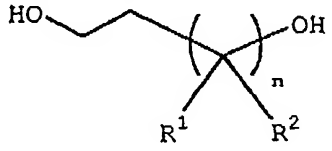
General formula (1):



..... (1)

(wherein R^1 and R^2 each independently represents hydrogen, an alkyl group having 1 to 8 carbon atoms, a cycloalkyl group having 3 to 10 carbon atoms, or an aryl group having 6 to 13 carbon atoms and n represents an integer of 1 to 6);

General formula (2):



.....(2)

(wherein R^1 and R^2 each independently represents hydrogen, a cycloalkyl group, an aryl group or an alkyl group having 1 to 8 carbon atoms, and n represents an integer of 1 to 6).

2. A catalyst for producing both end-hydroxyl group-terminated diols according to claim 1, which comprises at least one element selected from the group

consisting of Fe, Co, Ni, Cu, Re and Ru.

3. A catalyst for producing both end-hydroxyl group-terminated diols according to claim 1 or 2, which is a sponge-type catalyst.

4. A catalyst for producing both end-hydroxyl group-terminated diols according to claim 1 or 2, which is a carrier-type catalyst.

5. A catalyst for producing both end-hydroxyl group-terminated diols according to claim 4, wherein the carrier comprises as least one species selected from the group consisting of: activated carbon, alumina, silica, silica alumina, zeolite, diatomaceous earth, titania, and zirconia.

6. A process for producing a catalyst for producing both end-hydroxyl group-terminated diols according to claim 3, which comprises at least the following Step (A) and Step (B):

Step (A): a step of producing an alloy of aluminum and at least one element selected from the group consisting of Group V elements, Group VI elements, Group VII elements, Group VIII elements, Group IX elements, Group X elements, and Group XI elements in the periodic table;

Step (B): a step of eluting aluminum from the alloy obtained in Step (A), to thereby produce a catalyst for producing both end-hydroxyl group-terminated diols.

7. A process for producing a catalyst for producing both end-hydroxyl group-terminated diols according to claim 4 or 5, which comprises at least the following Step (C) and Step (D):

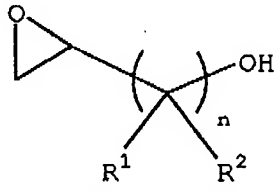
Step (C): a step of causing at least one element or a compound containing the at least one element to be carried on a carrier, the element being selected from the group consisting of Group V elements, Group VI elements, Group VII elements, Group VIII elements, Group IX elements, Group X elements, and Group XI elements in the periodic table, to thereby produce a carrier carrying

thereon the at least one element;

Step (D): a step of hydrogenating the at least one element carried on the carrier obtained in Step (C), to thereby produce a catalyst for producing both end-hydroxyl group-terminated diols.

8. A process for producing a both end-hydroxyl group-terminated diol, wherein an epoxy alcohol represented by the following general formula (1) is subjected to a hydrogenolysis reaction in the presence of a catalyst for producing both end-hydroxyl group-terminated diols according to any of claims 1-5, in the presence of at least one solvent selected from the group consisting of ethers, esters, aromatic hydrocarbon compounds, alicyclic hydrocarbon compounds and aliphatic hydrocarbon compounds, to thereby obtain a both end-hydroxyl group-terminated diol represented by the following general formula (2).

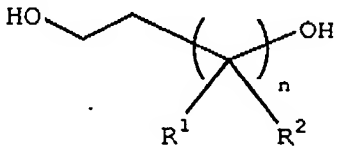
General formula (1):



..... (1)

(wherein R^1 and R^2 each independently represents hydrogen, an alkyl group having 1 to 8 carbon atoms, a cycloalkyl group having 3 to 10 carbon atoms, or an aryl group having 6 to 13 carbon atoms and n represents an integer of 1 to 6);

General formula (2):

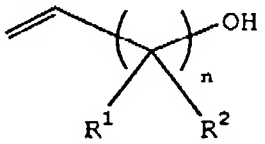


.....(2)

(wherein R^1 and R^2 each independently represents hydrogen, a cycloalkyl group, an aryl group or an alkyl group having 1 to 8 carbon atoms, and n represents an integer of 1 to 6).

9. A process for producing a both end-hydroxyl group-terminated diol according to claim 8, wherein the epoxy alcohol represented by the following general formula (1) is a compound which has been obtained by the epoxidizing an unsaturated alcohol compound represented by formula (3):

General Formula (3):



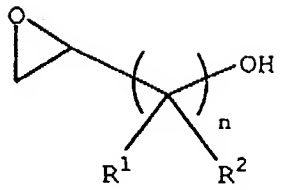
(wherein R^1 and R^2 each independently represents hydrogen, an alkyl group having 1 to 8 carbon atoms, a cycloalkyl group having 3 to 10 carbon atoms, or an aryl group having 6 to 13 carbon atoms and n represents an integer of 1 to 6).

10. A process for producing a both end-hydroxyl group-terminated diol represented by the general formula (2), which comprises at least the following Step (E) and Step (F):

Step (E): a step of epoxidizing an unsaturated alcohol compound represented by general formula (3), to thereby obtain an epoxy alcohol represented by the general formula (1);

Step (F): a step of subjecting the epoxy alcohol compound to a hydrogenolysis reaction in the presence of a catalyst for producing a both end-hydroxyl group-terminated diols according to any of claims 1-5, and in the presence of at least one solvent selected from the group consisting of ethers, esters, aromatic hydrocarbon compounds, alicyclic hydrocarbon compounds and aliphatic hydrocarbon compounds, to thereby obtain a both end-hydroxyl group-terminated diol represented by the following general formula (2).

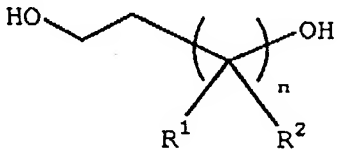
General formula (1):



..... (1)

(wherein R^1 and R^2 each independently represents hydrogen, an alkyl group having 1 to 8 carbon atoms, a cycloalkyl group having 3 to 10 carbon atoms, or an aryl group having 6 to 13 carbon atoms and n represents an integer of 1 to 6);

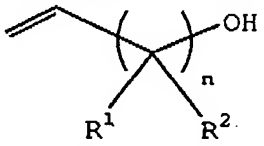
General formula (2):



.....(2)

(wherein R^1 and R^2 each independently represents hydrogen, an alkyl group having 1 to 8 carbon atoms, a cycloalkyl group having 3 to 10 carbon atoms, or an aryl group having 6 to 13 carbon atoms and n represents an integer of 1 to 6)

General Formula (3):



(wherein R^1 and R^2 each independently represents hydrogen, an alkyl group having 1 to 8 carbon atoms, a cycloalkyl group having 3 to 10 carbon atoms, or an aryl group having 6 to 13 carbon atoms and n represents an integer of 1 to 6);

11. A process for producing a both end-hydroxyl group-terminated diol according to any of claims 8-10, wherein the epoxy alcohol represented by the following general formula (1) is at least one epoxy alcohol compound selected from the group consisting of: glycidol, 3,4-epoxy-1-butanol and 3,4-epoxy-2-butanol.

12. A process for producing a both end-hydroxyl

group-terminated diol according to claims 9 or 10, wherein the an unsaturated alcohol compound represented by general formula (3) is at least one unsaturated alcohol compound selected from the group consisting of: allyl alcohol, 3-buten-1-ol and 3-buten-2-ol.

13. A process for producing a both end-hydroxyl group-terminated diol according to any of claims 8-12, wherein the solvent is at least one species selected from the group consisting of diethyl ether, dibutyl ether, ethylene glycol dimethyl ether, ethylene glycol diethyl ether, 1,4-dioxane, benzene, toluene, xylene, cyclohexane, hexane, ethyl acetate, propyl acetate, isopropyl acetate and butyl acetate.

14. A both end-hydroxyl group-terminated diol, which has been produced by a process for producing a both end-hydroxyl group-terminated diol according to any of claims 8-13.